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III. "On some Varieties in Human Myology." By JOHN WOOD, F.R.C.S., Demonstrator of Anatomy in King's College, London. Communicated by Professor HUXLEY, F.R.S. Received May 6, 1864.

(Abstract.)

The paper gives the results of the author's observations on human muscular variations observed during the last fifteen years, and extending over upwards of six hundred subjects. Many of the more striking varieties were drawn by the author from the subject, and form a series of thirty-seven illustrations accompanying the paper. Some of them he has not found placed on record by any authority he has consulted. The author classifies these muscular variations as follows, viz. :—

Variations with redundancy.

1st. Those which have an origin in a development totally independent of any other muscles or tendons.

2nd. Those which consist of extensions or offsets from normal muscles or tendons, and of muscular fibres replacing tendons, and tendinous fibres intersecting muscles.

3rd. Those which are formed by simple areolar separation or segregation of muscles.

These are given in the order of their rarity, and of their comparative value in reference to the muscular anatomy of the lower animals.

Variations with deficiency.

1st. Those produced by total suppression of the germs of muscles.

2nd. Those resulting from amalgamation with neighbouring muscles.

3rd. Those from atrophy or degeneration subsequent to their formation.

All the illustrations belong to the former class, which supply the most fitting subjects for them.

The frequency of varieties of all kinds in the human subject is very great. Few subjects are to be found entirely free from them. Muscular variations are rather more common in the male sex. In them, also, variations with redundancy calculated to increase muscular power, such as are classed in the 2nd division of that section, are more common, but may be also associated in the same individual with anomalies from defect or diminution. The same individual is frequently found subject to more than one irregularity, a muscular irregularity of a marked kind being generally associated with several others. Probably the source is hereditary, as is undoubtedly the case with those which result in deformity. Muscular variations are more common in the arm, back, leg, and head, and least common, as a rule, in the abdomen, the groin excepted. They are generally more or less symmetrical, though often much more evident on one side than the other. Distinct developments are usually found on both sides. Variations by

redundancy more frequent or more developed on the right side ; those from deficiency on the left.

Variations by simple reduplication.

The following muscles have been observed double, or in two distinct layers :—Pectoralis, major and minor ; gluteus maximus ; soleus ; pyramidalis abdominis ; pyriformis ; subclavius.

Variations by deficiency.

The following have been seen *totally* deficient :—Psoas parvus ; palmaris longus ; superior and inferior gemellus ; extensor minimi digiti ; pyramidalis abdominis ; pyriformis ; peronæus tertius ; extensor primi internodii pollicis ; trapezius ; plantaris and palmaris brevis (rarely).

The following have been seen *partly* deficient :—Trapezius ; omo-hyoid ; sterno-hyoid ; serratus magnus ; internal oblique and transversalis abdominis ; soleus.

Other varieties observed (all illustrated by drawings).

1. An offset from the *platysma myoides* below the ear, reaching from the trapezius and occipito-frontalis to the parotid fascia and risorius Santorini (homologue of the panniculus carnosus).

2. Extensive origin of *omo-hyoid* from the clavicle, in addition to its scapular attachment.

3. Double *omo-hyoid*, the upper one digastric, the lower uninterrupted by tendon, and attached to base of coracoid process. Not before recorded.

4. *Levator claviculæ*.—Clavio- or acromio-trachelian, observed in two subjects, on both sides, arising with the *levator anguli scapulæ* from the third and fourth cervical transverse processes, and inserted into the *outer third of the clavicle* under the trapezius. Found in all the Ape-tribe.

5. *Costo-fascialis*.—A broad muscular band arising from the first rib and cartilage, outside the sterno-thyroid, and lost in the fascia of the upper half of the neck. Not before described.

6. A double anterior belly to the *digastric* muscle, with complete decussation across the median line. The latter peculiarity not before recorded.

7. *Sternalis brutorum*.—*Rectus sternalis* vel *thoracicus* connected above with a prolongation downwards of the sternal tendon of the sterno-mastoid, muscular fibres spreading out below over the sternal and epigastric aponeurosis, and attached to the xiphoid and fifth, sixth, and seventh costal cartilages.

8. *Double subclavius*.—The lower fibres distinct from upper, with cephalic vein passing between them, and attached to the coracoid process.

9. Broad slips from *pectoralis major* and *latissimus dorsi*, passing across axillary vessels and nerves, and attached, low down the arm, to the aponeurosis inserted into the inner condyle of humerus and olecranon process. These slips are highly developed in some of the anthropoid Apes ;

the former especially in the Gibbon. The same subject, a muscular male, showed also a high and large origin of the *pronator radii teres* in common with the *brachialis anticus*.

10. *Chondro-coracoid* muscle, passing from the latissimus dorsi at tenth rib to the tip of the coracoid process. Not before recorded. The same subject showed also a low origin of the *pectoralis minor*.

11. *Biceps* with four heads.—Of the two additional heads, the inner arises with the *brachialis anticus*, and the outer with the *supinator longus*. In the same arm is a slip from the *coraco-brachialis* to the internal inter-muscular septum, passing down to the condyle, and perforated by the brachial artery.

12. *Coraco-capsularis*.—A muscular slip from the tip of the coracoid process to the capsular ligament of the shoulder-joint, inserted between subscapular and triceps muscles.

13. *Brachio-fascialis*, passing from the *brachialis anticus* to the fascia over the flexor muscles of the forearm, coexistent with the semilunar fascia from the biceps.

14. *Palmaris longus*, with inverted belly and double origin, the additional one (tendinous) from the oblique line of the radius above the flexor sublimis. Given off from it also is the *flexor brevis minimi digiti*. A precisely similar arrangement of this very uncertain muscle not before recorded. A somewhat similar arrangement found in the *Cebus* and *Magot*.

15. Three distinct muscles and tendons connecting,—1, the *flexor pollicis longus* with the indicial tendon of the *flexor profundus digitorum*; 2, the *flexor sublimis* (coronoid origin) with the *flexor pollicis longus*; and 3, the flexor sublimis with the *flexor profundus* (middle part). Segregation also of the indicial portion of the flexor profundus.

16. *Flexor brevis minimi digiti*. Additional long, broad, fleshy origin from the fascia of the forearm, and another from the tendon of *flexor carpi ulnaris*. Aponeurotic slip given off to transverse metacarpal ligament.

17. Striking abnormality seen in two male subjects on both sides. A long tendon with bulky, muscular belly above, arising from the outer condyloid ridge of humerus with the *extensor carpi radialis longior*, and inserted in one case into the base of the first metacarpal bone and origin of the *abductor pollicis*, and in the other passing entirely into the latter muscle. Not before recorded.

18. *Extensor primi internodii pollicis et indicis*.—Arising by a distinct belly above the indicator, going along with that muscle, and giving off two tendons, one to be implanted outside the indicator tendon, and the other to supply the place of the *extensor primi internodii pollicis*. Not before recorded in the human subject. Found in the Dog.

19. *Extensor proprius digiti medii*.—A distinct extensor of the first phalanx of the middle finger, arising from the ulna below the indicator.

20. *Extensor minimi digiti* with double tendon, one going to the fourth finger. Associated with this are three curious slips or displacements of

the *dorsal interossei*, arising from the base of the metacarpal, os magnum and unciforme, and attached to the common expansion of the *extensor* tendons behind the slips from the interossei. These slips are considered by the author to indicate a tendency to the formation of an *extensor brevis digitorum manus*, by posterior displacement of the fibres of the dorsal interossei.

21. A. *Musculus interosseus volaris primus*.—A palmar interosseous going to the dorsal aponeurosis of the thumb. Not usually described, though often present. Mentioned by Henle.

B. In a hand from the subject before given in 9 and 17, all the dorsal interossei were arranged in two portions easily separable. In the first interosseous space the *abductor indicis* was very distinctly divided into a posterior part, arising in the usual manner, and inserted into the base of the first phalanx; and an anterior, arising from the first metacarpal, and inserted partly (by a small slip) into the second metacarpal, but chiefly (by a very distinct tendon) into the dorsal expansion of the common extensor tendon of the index. Not before recorded in the human subject. A similar arrangement found in the Gorilla and other Simiæ.

22. Strong muscular slips seen in the male perineum, arising from the usual attachment of the *transversi perinei* to the ischial tuberosity, and inserted with the front fibres of the *accelerator urinæ* into the dorsal fascia of the penis and corpora cavernosa, in front of the *erector penis*. Not before recorded.

23. Separation of the anterior fibres of the *gluteus minimus* into a distinct muscle homologous with the *scansorius* of Traill, or *invertor femoris* of Owen, found in the Orang and others of the Ape-tribe.

24. *Tensor fasciæ plantaris*.—Arising from the oblique line of the tibia under the soleus, and inserted into the internal annular ligament, near the tuberosity of the os calcis.

25. *Flexor accessorius longus digitorum*.—Fleshy from the aponeurosis halfway up the back of the leg, with a tendon joining the *flexor accessorius* and tendon of the *flexor longus digitorum*.

The *superficial flexor* tendon of the little toe was also, in the same foot, supplied from the outer fibres of the *flexor accessorius*. Not before recorded.

26. *Peroneus quinti digiti*.—In most instances a tendinous, but in one a fleshy offset from the *peroneus brevis*, below the outer ankle-bone, to the expansion of the common extensor tendon of the little toe. Very frequent in the human subject, usual in the Apes.

27. *Tensor fasciæ dorsalis pedis*, from the lower third of fibula to the anterior annular ligament and dorsal fascia. Not before recorded.

28. *Tibialis anticus* tendon divided into three parts, going respectively to the inner cuneiform, base of metatarsal, and first phalangeal bone of the great toe. The last-mentioned offset not before recorded. Similar arrangement in the Quadrumana.

29. *Extensor primi internodii hallucis*, or proper extensor of the first

phalanx of the great toe, arising fleshy from the tibia, inside the *extensor proprius*, and below the *tibialis anticus*. Strong tendon implanted into base of first phalanx inside the short common extensor.

30. The same muscle in another subject, having a different arrangement. Arising from the interosseous ligament *outside* the *extensor proprius*, and inserted by a tendon into that of the short common extensor going to the great toe. Neither of these have been before recorded.

31. A. The *deep flexor* tendon of the little toe supplied by a distinct muscle arising from the inner tubercle of the os calcis. Not before recorded.

B. A very large development of the *flexor accessorius* inserted into both the *long common flexor* and *long flexor of the great toe* tendons.

32. A. *Abductor ossis metatarsi quinti*.—A distinct muscle found by the author in more than one-half of the subjects in which he has looked for it, concealed by the outer part of the plantar fascia and *abductor minimi digiti* muscle, arising from the outer tubercle of the os calcis by a round fleshy belly, and inserted into the base of the fifth metatarsal by a distinct round tendon. Not before observed in the human subject. Found in the Gorilla and Chimpanzee by Huxley and Flower.

B. *Opponens minimi digiti*.—Very commonly found, though not described in anatomical text-books. Arises tendinous from the ligament of the fifth metatarsal and cuboid, and inserted in a bipennate way into the whole length of the fifth metatarsal bone. Found well developed in all the Apes.

IV. "Researches on Isomeric Alkaloids." By C. GREVILLE WILLIAMS, F.R.S. Received May 12, 1864.

(Abstract.)

The experiments recorded in the following paper have for their object the determination of two questions:—

1. Whether the base produced by destructive distillation of cinchonine, and having the formula $C^7H^{9'''}N$, is isomeric or identical with the lutidine from Dippel's oil? and

2. How far the chinoline series of bases, isomeric with the leukoline series, extends beyond lepidine?

In one form or another the observations have been going on for some years, but it is only lately that results have been obtained which appear conclusive.

The first of the above questions is connected with one of the most difficult problems occupying the attention of chemists at the present day, namely that of isomerism. It is true that some isomeric bodies differ so widely in their physical and chemical characters that no difficulty exists in distinguishing them. Thus the members of the aniline and pyridine series have, save their formulæ, few points of resemblance; cespitine and